

THAT WHICH IS CLAIMED IS:

1. A method of processing eggs having an identified characteristic, comprising:  
extracting material from each of a plurality of eggs;

5           assaying the material extracted from each egg to identify eggs having a characteristic; and  
            selectively processing eggs identified as having the characteristic.

2. The method of Claim 1, further comprising:  
identifying live eggs among the plurality of eggs prior to extracting material; and  
5           extracting material from eggs identified as live eggs.

3. The method of Claim 2, wherein identifying live eggs comprises candling the eggs.

4. The method of Claim 2, wherein identifying live eggs comprises:

5           illuminating each egg with light from a light source, wherein the light includes light in both visible and infrared wavelengths;

            receiving light passing through each egg at a detector positioned adjacent each egg;

10           determining intensity of the received light at selected ones of the visible and infrared wavelengths for each egg;

            generating a spectrum for each egg that represents light intensity at the plurality of visible and infrared wavelengths; and

15           comparing the generated spectrum for each egg with a spectrum associated with a live egg to identify

live eggs.

5        5.     The method of Claim 4, wherein the step of  
illuminating each egg with light comprises illuminating  
each egg with light at wavelengths of between about three  
hundred nanometers and about eleven hundred nanometers  
(300 nm - 1,100 nm).

5        6.     The method of Claim 2, wherein identifying  
live eggs comprises:  
         measuring the opacities of the plurality of  
eggs;  
         measuring the temperatures of the plurality of  
eggs; and  
         identifying live eggs using the measured  
opacities and temperatures.

7.     The method of Claim 1, wherein extracting  
material from the eggs comprises extracting allantoic  
fluid, amnion, yolk, shell, albumen, tissue, membrane  
and/or blood from the eggs.

5        8.     The method of Claim 7, wherein  
extracting material from the eggs comprises:  
         positioning each of the eggs in a generally  
horizontal orientation whereby an allantois of each egg  
is caused to pool and enlarge an allantoic sac under an  
upper portion of each egg shell;  
         inserting a probe into each egg through the  
shell of the egg and directly into the enlarged allantoic  
sac; and  
10        withdrawing a sample of allantoic fluid from  
the allantois of each egg via each probe.

9.     The method of Claim 8, wherein positioning  
each of the eggs in a generally horizontal orientation

5 comprises positioning each of the eggs such that a long axis of each egg is oriented at an angle between about 10 degrees and about 180 degrees from vertical, wherein zero degrees vertical is defined by a large end of an egg in a vertically upward position.

10. The method of Claim 8, further comprising:  
repositioning each of the eggs from a generally horizontal orientation to a generally vertical orientation after allantoic fluid is withdrawn therefrom;  
5 and

moving the generally vertically oriented eggs to another location.

11. The method of Claim 8, wherein  
assaying the material extracted from each egg to identify one or more characteristics of each egg comprises  
detecting a presence of an estrogenic compound in the  
5 extracted allantoic fluid.

12. The method of Claim 11, wherein  
detecting a presence of an estrogenic compound comprises:  
dispensing allantoic fluid extracted from the  
eggs into respective receptacles;

5 dispensing a biosensor into the receptacles,  
wherein the biosensor is configured to chemically react with an estrogenic compound in the allantoic fluid and change a color of the allantoic fluid; and

10 detecting a color change of the allantoic fluid within the receptacles.

13. The method of Claim 11, wherein  
detecting a presence of an estrogenic compound comprises:  
dispensing allantoic fluid extracted from the  
eggs into respective receptacles, wherein each receptacle  
5 contains a biosensor configured to chemically react with

an estrogenic compound in the allantoic fluid and change a color of the allantoic fluid; and

detecting a color change of the allantoic fluid within the receptacles.

5 14. The method of Claim 1, wherein assaying the material extracted from each egg to identify one or more characteristics of each egg comprises identifying gender of each egg, and wherein selectively processing the live eggs comprises selectively injecting a vaccine into the eggs of gender.

15. The method of Claim 13, further comprising injecting a first vaccine into eggs identified as male, and injecting a second vaccine into eggs identified as female.

5 16. The method of Claim 1, wherein assaying the material extracted from each egg to identify one or more characteristics of each egg comprises identifying gender of each egg, and wherein processing the live eggs comprises removing eggs identified as having the same gender.

5 17. The method of Claim 1, wherein assaying the material extracted from each egg to identify one or more characteristics of each egg comprises identifying one or more pathogens within each egg, and wherein processing the live eggs comprises removing eggs identified as having one or more pathogens.

18. The method of Claim 1, wherein assaying the material extracted from each egg to identify one or more characteristics of each egg comprises performing genetic analysis on each egg.

19. A method of processing eggs based on gender, comprising:

identifying live eggs among a plurality of eggs;

5 extracting material from the eggs identified as live eggs;

assaying the material extracted from each live egg to identify gender of each live egg; and

10 selectively injecting a vaccine into the live eggs according to gender.

20. The method of Claim 19, further comprising sorting the live eggs according to gender prior to selectively injecting a vaccine into the live eggs.

21. The method of Claim 19, further comprising sorting the live eggs according to gender after selectively injecting a vaccine into the live eggs.

22. The method of Claim 19, wherein identifying live eggs comprises candling the eggs.

23. The method of Claim 19, wherein identifying live eggs comprises:

5 illuminating each egg with light from a light source, wherein the light includes light in both visible and infrared wavelengths;

receiving light passing through each egg at a detector positioned adjacent each egg;

10 determining intensity of the received light at selected ones of the visible and infrared wavelengths for each egg;

generating a spectrum for each egg that represents light intensity at the plurality of visible and infrared wavelengths; and

comparing the generated spectrum for each egg

15 with a spectrum associated with a live egg to identify  
live eggs.

24. The method of Claim 19, wherein the step  
of illuminating each egg with light comprises  
illuminating each egg with light at wavelengths of  
between about three hundred nanometers and about eleven  
5 hundred nanometers (300 nm - 1,100 nm).

25. The method of Claim 19, wherein  
identifying live eggs comprises:  
measuring the opacities of the plurality of  
eggs;  
5 measuring the temperatures of the plurality of  
eggs; and  
identifying live eggs using the measured  
opacities and temperatures.

26. The method of Claim 19, wherein extracting  
material from the eggs comprises extracting allantoic  
fluid, amnion, yolk, shell, albumen, tissue, membrane  
and/or blood from the eggs.

27. The method of Claim 26, wherein assaying  
the material extracted from each live egg to identify  
gender of each live egg comprises detecting the presence  
of an estrogenic compound in the allantoic fluid  
5 extracted from each live egg.

28. The method of Claim 26, wherein  
extracting material from the eggs comprises:  
positioning each of the live eggs in a  
generally horizontal orientation whereby an allantois of  
5 each egg is caused to pool and enlarge an allantoic sac  
under an upper portion of each egg shell;  
inserting a probe into each egg through the

shell of the egg and directly into the enlarged allantoic sac; and

10                withdrawing a sample of allantoic fluid from the allantois of each egg via each probe.

29. The method of Claim 28, wherein positioning each of the live eggs in a generally horizontal orientation comprises positioning each of the live eggs such that a long axis of each egg is oriented  
5                at an angle between about 10 degrees and about 180 degrees from vertical, wherein zero degrees vertical is defined by a large end of an egg in a vertically upward position.

30. The method of Claim 28, further comprising:

                 repositioning each of the live eggs from a generally horizontal orientation to a generally vertical orientation after allantoic fluid is withdrawn therefrom;  
5                and

                 moving the generally vertically oriented live eggs to another location.

31. The method of Claim 27, wherein detecting a presence of estrogen compounds comprises:  
                 dispensing allantoic fluid extracted from the live eggs into respective receptacles;

5                dispensing a biosensor into the receptacles, wherein the biosensor is configured to chemically react with an estrogenic compound in the allantoic fluid and change a color of the allantoic fluid; and

10                detecting a color change of the allantoic fluid within the receptacles.

32. The method of Claim 27, wherein detecting a presence of estrogen compounds comprises:

dispensing allantoic fluid extracted from the  
eggs into respective receptacles, wherein each receptacle  
contains a biosensor configured to chemically react with  
an estrogenic compound in the allantoic fluid and change  
a color of the allantoic fluid; and

detecting a color change of the allantoic fluid  
within the receptacles.

33. The method of Claim 19, wherein  
detecting a presence of estrogen compounds comprises:

dispensing allantoic fluid extracted from the  
eggs into respective receptacles, wherein each receptacle  
contains a biosensor configured to chemically react with  
an estrogenic compound in the allantoic fluid and produce  
a detectable signal; and

detecting a signal produced within one or more  
of the receptacles.

34. A method of processing eggs according to  
gender, comprising:

identifying live eggs among a plurality of  
eggs;

extracting allantoic fluid from the eggs  
identified as live eggs, comprising:

positioning each of the live eggs in a  
generally horizontal orientation whereby an  
allantois of each egg is caused to pool and  
enlarge an allantoic sac under an upper portion  
of each egg shell;

inserting a probe into each egg through  
the shell of the egg and directly into the  
enlarged allantoic sac; and

withdrawing a sample of allantoic fluid  
from the allantois of each egg via each probe;  
detecting a presence of an estrogenic compound  
in the allantoic fluid extracted from each live egg to



identify a gender of each live egg, comprising:

20           dispensing allantoic fluid extracted from  
the live eggs into respective receptacles;  
          dispensing a biosensor into the  
receptacles, wherein the biosensor is  
configured to chemically react with an  
25           estrogenic compound in the allantoic fluid and  
change a color of the allantoic fluid; and  
          detecting a color change of the allantoic  
fluid within the receptacles; and  
          selectively injecting a vaccine into the live  
30           eggs according to gender.

35. The method of Claim 34, further comprising  
sorting the live eggs according to gender.

36. The method of Claim 34, wherein  
identifying live eggs comprises candling each egg.

37. The method of Claim 34, wherein  
selectively injecting a vaccine into the live eggs  
according to gender comprises injecting a first vaccine  
into live eggs identified as male, and injecting a second  
5           vaccine into live eggs identified as female.

38. The method of Claim 34, wherein  
selectively injecting a vaccine into the live eggs  
according to gender comprises injecting a vaccine into  
live eggs identified as having the same gender.

39. An apparatus for extracting material from  
a plurality of eggs, comprising:

          a table comprising a plurality of cradles  
arranged in an array, wherein each cradle is configured  
5           to receive an egg in a generally vertical orientation and  
to cause the egg to move to a generally horizontal

orientation;

an egg transfer device operably associated with the table, wherein the egg transfer device is configured to simultaneously lift a plurality of generally vertically oriented eggs from an egg flat and place the plurality of eggs within respective cradles, and wherein the egg transfer device is configured to simultaneously lift and remove the plurality of eggs from the plurality of cradles; and

a plurality of sample heads operably associated with the table, each of which is configured to extract material from a respective egg within a respective cradle and to deposit the extracted material within a respective sample receptacle in a sample template.

40. The apparatus of Claim 39, further comprising a plurality of orientation members, wherein each orientation member is operably associated with a respective cradle, and wherein each orientation member is configured to urge an egg within a respective cradle from a generally horizontal orientation to a generally vertical orientation.

41. The apparatus of Claim 39, further comprising a classifier that is configured to identify live eggs among a plurality of eggs.

42. The apparatus of Claim 41, wherein the classifier comprises an egg candling device.

43. The apparatus of Claim 39, further comprising a sanitizer that is configured to apply sanitizing fluid to each sample head after each sample head has deposited material extracted from an egg into a respective sample receptacle.

44. The apparatus of Claim 39, further comprising a processor that is configured to create and store an association between material deposited within a sample receptacle with an egg from which the material was extracted from.

45. The apparatus of Claim 41, wherein the egg transfer device is operably associated with the classifier and is configured to simultaneously lift only eggs identified as live eggs from an egg flat.

46. The apparatus of Claim 41, wherein the sample heads are operably associated with the classifier and are configured to only extract material from eggs identified as live eggs.

47. The apparatus of Claim 39, wherein the egg transfer device comprises:

a frame;

an array of manifold blocks movably supported by the frame, wherein each manifold block comprises an end portion and an internal passageway that terminates at a nozzle extending from the end portion, and wherein the array is expandable and contractible such that eggs can be lifted from and placed within egg flats of different sizes and/or array configurations; and

a plurality of flexible cups, each secured to a respective manifold block nozzle and each in fluid communication with an internal passageway of a respective manifold block, wherein each flexible cup is configured to engage and retain an egg in seated relation therewith when vacuum is provided within the flexible cup via a respective internal passageway and wherein each flexible cup is configured to release a respective egg when vacuum within the respective internal passageway is destroyed.

48. The apparatus of Claim 39, wherein each sample head comprises:

an elongated housing having opposite first and second ends and an elongated passageway extending therebetween; and

an elongated needle disposed within the elongated passageway and movable between a retracted position and first and second extended positions, wherein the needle comprises a tip, wherein the tip of the needle is contained within the passageway when the needle is in the retracted position, wherein the tip of the needle extends from the housing first end a first distance when the needle is in the first extended position, wherein the tip of the needle extends from the housing first end a second distance greater than the first distance when the needle is in the second extended position, wherein the needle is configured to extract material from an egg when in the first extended position, and wherein the needle is configured to dispense material extracted from an egg into a sample receptacle when in the second extended position.

49. The apparatus of Claim 39, further comprising an alignment member associated with each sample head that is configured to adjust a position of an egg within a respective cradle.

50. The apparatus of Claim 39, further comprising:

an egg flat transport system positioned adjacent to the table that transports flats of eggs to the egg transfer device; and

an egg flat transport system positioned adjacent to the table that transports flats of eggs from the egg transfer device.

51. The apparatus of Claim 39, further comprising a sample template transport system positioned adjacent to the table and operably associated with the plurality of sample heads that transports sample templates to and from the plurality of sample heads.

52. The apparatus of Claim 39, further comprising an egg cradle transport system operably associated with the table that moves the array of cradles relative to the plurality of sample heads.

53. The apparatus of Claim 48, further comprising a locking plate operably associated with the plurality of sample heads, wherein the locking plate is configured to releasably restrain each elongated housing from movement when the needle is extended from the housing first end to the first extended position.

54. An apparatus for extracting material from a plurality of eggs, comprising:

a table comprising a plurality of cradles arranged in an array, wherein each cradle is configured to receive an egg in a generally vertical orientation and to cause the egg to move to a generally horizontal orientation;

an egg transfer device operably associated with the table, comprising:

a frame;

an array of manifold blocks movably supported by the frame, wherein each manifold block comprises an end portion and an internal passageway that terminates at a nozzle extending from the end portion, and wherein the array is expandable and contractible such that eggs can be lifted from and placed within egg flats of different sizes and/or array

configurations; and

a plurality of flexible cups, each secured to a respective manifold block nozzle and each in fluid communication with an internal passageway of a respective manifold block, wherein each flexible cup is configured to engage and retain an egg in seated relation therewith when vacuum is provided within the flexible cup via a respective internal passageway and wherein each flexible cup is configured to release a respective egg when vacuum within the respective internal passageway is destroyed;

wherein the egg transfer device is configured to simultaneously lift a plurality of generally vertically oriented eggs from an egg flat and place the plurality of eggs within respective cradles, and wherein the egg transfer device is configured to simultaneously lift and remove the plurality of eggs from the plurality of cradles; and

a plurality of sample heads operably associated with the table, wherein each sample head is configured to extract material from a respective egg within a respective cradle and to deposit the extracted material within a respective sample receptacle in a sample template, wherein each sample head comprises:

an elongated housing having opposite first and second ends and an elongated passageway extending therebetween; and

an elongated needle disposed within the elongated passageway and movable between a retracted position and first and second extended positions, wherein the needle comprises a tip, wherein the tip of the needle is contained within the passageway when the

55 needle is in the retracted position, wherein  
the tip of the needle extends from the housing  
first end a first distance when the needle is  
in the first extended position, wherein the tip  
of the needle extends from the housing first  
60 end a second distance greater than the first  
distance when the needle is in the second  
extended position, wherein the needle is  
configured to extract material from an egg when  
in the first extended position, and wherein the  
65 needle is configured to dispense material  
extracted from an egg into a sample receptacle  
when in the second extended position.

55. The apparatus of Claim 54, further  
comprising a plurality of orientation members, wherein  
each orientation member is operably associated with a  
respective cradle, and wherein each orientation member is  
5 configured to urge an egg within a respective cradle from  
a generally horizontal orientation to a generally  
vertical orientation.

56. The apparatus of Claim 54, further  
comprising a classifier that is configured to identify  
live eggs among a plurality of eggs.

57. The apparatus of Claim 56, wherein the  
classifier comprises an egg candling device.

58. The apparatus of Claim 54, further  
comprising a sanitizer that is configured to apply  
sanitizing fluid to each sample head after each sample  
head has deposited material extracted from an egg into a  
5 respective sample receptacle.

59. The apparatus of Claim 54, further

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comprising a processor that is configured to create and store an association between material deposited within a sample receptacle with an egg from which the material was extracted from.

60. The apparatus of Claim 56, wherein the egg transfer device is operably associated with the classifier and is configured to simultaneously lift only eggs identified as live eggs from an egg flat.

61. The apparatus of Claim 56, wherein the sample heads are operably associated with the classifier and are configured to only extract material from eggs identified as live eggs.

62. The apparatus of Claim 54, further comprising an egg flat transport system positioned adjacent to the table that transports flats of eggs to the egg transfer device.

63. The apparatus of Claim 54, further comprising an egg flat transport system positioned adjacent to the table that transports flats of eggs from the egg transfer device.

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64. The apparatus of Claim 54, further comprising a sample template transport system positioned adjacent to the table and operably associated with the plurality of sample heads that transports sample templates to and from the plurality of sample heads.

65. The apparatus of Claim 54, further comprising an egg cradle transport system operably associated with the table that moves the array of cradles relative to the plurality of sample heads.



66. The apparatus of Claim 54, further comprising a locking plate operably associated with the plurality of sample heads, wherein the locking plate is configured to releasably restrain each elongated housing from movement when the needle is extended from the housing first end to the first extended position.

67. The apparatus of Claim 54, wherein the plurality of sample heads comprises first and second sets of sample heads, wherein sample heads in the first set are configured to extract material from eggs within a plurality of cradles, and wherein sample heads in the second set are configured to deposit previously extracted material within respective sample receptacles.

68. An apparatus for extracting material from an egg, comprising:

an elongated housing having opposite first and second ends and an elongated passageway extending therebetween, wherein the elongated housing first end is configured to contact a portion of a shell of an egg; and

an elongated needle movably disposed within the elongated passageway and movable between a retracted position and first and second extended positions, wherein the needle comprises a fluid passageway and a tip, wherein the tip of the needle is contained within the passageway when the needle is in the retracted position, wherein the tip of the needle extends from the housing first end a first distance when the needle is in the first extended position, and wherein the tip of the needle extends from the housing first end a second distance greater than the first distance when the needle is in the second extended position;

wherein the elongated needle is configured to punch through the shell of an egg when the elongated housing first end is in contact with the egg shell and

the elongated needle is moved to the first extended position, wherein the elongated needle is configured to extract material from the egg into the fluid passageway when in the first extended position, and wherein the needle is configured to dispense extracted material in the fluid passageway into a sample receptacle when in the second extended position.

69. The apparatus of Claim 68, further comprising a biasing member disposed within the elongated housing, wherein the biasing member exerts a force on the elongated needle to urge the elongated needle from the second extended position to the first extended position.

70. The apparatus of Claim 69, further comprising an actuator that is configured to move the elongated needle between the retracted position and first and second extended positions, wherein the actuator is configured to exert first and second actuation force on the elongated needle, wherein the first actuation force is sufficient to move the elongated needle to the first extended position, and wherein the second actuation force is sufficient to move the elongated needle to the second extended position.

71. The apparatus of Claim 70, wherein the actuator comprises an air actuator that is in fluid communication with a compressed air system.

72. The apparatus of Claim 68, wherein the elongated needle tip comprises a blunt configuration.

73. The apparatus of Claim 68, wherein the elongated needle tip comprises a beveled configuration.

74. An apparatus for assaying material

5 extracted from a plurality of eggs to identify ones of  
the eggs having a characteristic, wherein material  
extracted from each egg is contained within a respective  
sample receptacle of a template, wherein the apparatus  
comprises:

10 a reagent dispenser that is configured to  
dispense a reagent into each of the receptacles of a  
template, wherein the reagent is configured to chemically  
react with the egg material in each receptacle to produce  
an indication of a characteristic of a respective egg;  
and

15 a detector that is configured to detect an  
indication of an egg characteristic in each of the  
receptacles.

75. The apparatus of Claim 74, wherein the  
detector comprises a CCD camera.

76. The apparatus of Claim 74, further  
comprising a sterilizer that is configured to destroy the  
reagent.

77. The apparatus of Claim 76, wherein the  
sterilizer comprises a sterilizing agent dispenser that  
is configured to dispense a sterilizing agent into each  
of the receptacles to destroy the reagent.

78. The apparatus of Claim 76, wherein the  
sterilizer comprises a heat generating source.

79. The apparatus of Claim 76, wherein the  
sterilizer comprises a radiation generating source.

80. The apparatus of Claim 74, wherein the  
reagent dispenser comprises a biosensor dispenser.

81. An apparatus for assaying material extracted from a plurality of eggs to identify ones of the eggs having a characteristic, wherein material extracted from each egg is contained within a respective sample receptacle of a template, wherein the apparatus comprises:

an environmentally-controlled chamber that maintains temperature and/or humidity within one or more respective predetermined ranges;

a conveyor system that is configured to convey a plurality of sample receptacle templates through the chamber;

a biosensor dispenser disposed within the chamber and operably associated with the conveyor system, wherein the biosensor dispenser is configured to dispense a biosensor into each of the receptacles of a template conveyed via the conveyor system;

a color substrate dispenser disposed within the chamber and operably associated with the conveyor system, wherein the color substrate dispenser is configured to dispense a color substrate into each of the receptacles of a template conveyed via the conveyor system, wherein the biosensor and color substrate are configured to chemically react with egg material in each respective receptacle so as to produce an indication of a presence of a characteristic of a respective egg; and

a detector operably associated with the conveyor system that is configured to scan each sample receptacle in a template conveyed via the conveyor system and to detect an indication of the presence of a characteristic.

82. The apparatus of Claim 81, wherein the detector comprises a CCD camera that is configured to detect a change in color of material in each sample receptacle of a template.

83. The apparatus of Claim 81, further comprising a sterilizer that is configured to destroy the biosensor.

84. The apparatus of Claim 83, wherein the sterilizer comprises a sterilizing agent dispenser that is configured to dispense a sterilizing agent into each of the receptacles to destroy the biosensor.

85. The apparatus of Claim 83, wherein the sterilizer comprises a heat generating source.

86. The apparatus of Claim 83, wherein the sterilizer comprises a radiation generating source.

87. The apparatus of Claim 81, wherein the biosensor dispenser comprises a yeast dispenser.

88. An apparatus for assaying material extracted from a plurality of eggs to identify gender of the eggs, wherein material extracted from each egg is contained within a respective sample receptacle of a template, wherein the apparatus comprises:

an environmentally-controlled chamber that maintains temperature and/or humidity within one or more respective predetermined ranges;

a conveyor system that is configured to convey a plurality of sample receptacle templates through the chamber;

a yeast dispenser disposed within the chamber and operably associated with the conveyor system, wherein the yeast dispenser is configured to dispense a yeast into each of the receptacles of a template conveyed via the conveyor system;

a color substrate dispenser disposed within the chamber and operably associated with the conveyor system,

wherein the color substrate dispenser is configured to  
 dispense a color substrate into each of the receptacles  
 of a template conveyed via the conveyor system, wherein  
 the yeast and color substrate are configured to  
 chemically react with egg material in each respective  
 receptacle so as to produce a color that indicates gender  
 of a respective egg; and

a CCD camera operably associated with the  
 conveyor system that is configured to scan each sample  
 receptacle in a template conveyed via the conveyor system  
 and to detect a color.

89. The apparatus of Claim 88, further  
 comprising a sterilizer that is configured to destroy the  
 yeast.

90. The apparatus of Claim 89, wherein the  
 sterilizer comprises a sterilizing agent dispenser that  
 is configured to dispense a sterilizing agent into each  
 of the receptacles to destroy the yeast.

91. An apparatus for selectively processing  
 eggs, comprising:

a conveyor configured to convey egg carriers;  
 a plurality of injection delivery devices  
 operably associated with the conveyor, wherein the  
 injection delivery devices are configured to inject a  
 substance into eggs identified among a plurality of eggs  
 in an egg carrier conveyed by the conveyor as having a  
 characteristic; and

an egg removal device operably associated with  
 the conveyor, wherein the egg removal device is  
 configured to remove eggs identified as having a  
 characteristic from an egg carrier conveyed by the  
 conveyor.

92. The apparatus of Claim 91, wherein the egg removal device comprises:

an array of manifold blocks, wherein each manifold block comprises an end portion and an internal passageway that terminates at a nozzle extending from the end portion; and

a plurality of flexible cups, each secured to a respective manifold block nozzle and each in fluid communication with an internal passageway of a respective manifold block, wherein each flexible cup is configured to engage and retain an egg in seated relation therewith when vacuum is provided within the flexible cup via a respective internal passageway and wherein each flexible cup is configured to release a respective egg when vacuum within the respective internal passageway is destroyed.

93. The apparatus of Claim 91, wherein the characteristic is gender, and wherein each injection delivery device is configured to inject a substance into eggs identified as having the same gender.

94. The apparatus of Claim 91, wherein the characteristic is gender, and wherein the egg removal device is configured to remove eggs from an egg carrier identified as having the same gender.

95. An apparatus for selectively processing eggs, comprising:

a conveyor configured to convey egg carriers;  
a first set of injection delivery devices operably associated with the conveyor, wherein the injection delivery devices in the first set are configured to inject a substance into eggs identified as having a first gender in an egg carrier conveyed by the conveyor;

a second set of injection delivery devices

operably associated with the conveyor and adjacent the first set of injection delivery devices, wherein the injection delivery devices in the second set are configured to inject a substance into eggs identified as having a second gender in the egg carrier; and

an egg removal device operably associated with the conveyor, wherein the egg removal device is configured to remove eggs identified as having a first gender from the egg carrier into a first receptacle, and to remove eggs identified as having a second gender from the egg carrier into a second receptacle.

96. The apparatus of Claim 95, wherein the egg removal device comprises:

an array of manifold blocks, wherein each manifold block comprises an end portion and an internal passageway that terminates at a nozzle extending from the end portion; and

a plurality of flexible cups, each secured to a respective manifold block nozzle and each in fluid communication with an internal passageway of a respective manifold block, wherein each flexible cup is configured to engage and retain an egg in seated relation therewith when vacuum is provided within the flexible cup via a respective internal passageway and wherein each flexible cup is configured to release a respective egg when vacuum within the respective internal passageway is destroyed.

97. An apparatus for selectively processing eggs, comprising:

a conveyor configured to convey egg carriers containing a plurality of eggs;

an egg removal device operably associated with the conveyor that segregates male eggs from female eggs;

a first set of injection delivery devices that are configured to inject a substance into male eggs; and



10 a second set of injection delivery devices that  
are configured to inject a substance into female eggs.

98. The apparatus of Claim 97, wherein the egg  
removal device comprises:

5 an array of manifold blocks, wherein each  
manifold block comprises an end portion and an internal  
passageway that terminates at a nozzle extending from the  
end portion; and

10 a plurality of flexible cups, each secured to a  
respective manifold block nozzle and each in fluid  
communication with an internal passageway of a respective  
manifold block, wherein each flexible cup is configured  
to engage and retain an egg in seated relation therewith  
when vacuum is provided within the flexible cup via a  
respective internal passageway and wherein each flexible  
cup is configured to release a respective egg when vacuum  
15 within the respective internal passageway is destroyed.

99. An egg processing system, comprising:

an apparatus for extracting material from a  
plurality of eggs;

5 an apparatus for assaying material extracted  
from the eggs to identify eggs having a characteristic;  
and

an apparatus for selectively processing eggs  
identified as having the characteristic.

100. The system of Claim 99, wherein the  
apparatus for extracting material from a plurality of  
eggs comprises:

5 a table comprising a plurality of cradles  
arranged in an array, wherein each cradle is configured  
to receive an egg in a generally vertical orientation and  
to cause the egg to move to a generally horizontal  
orientation;

an egg transfer device operably associated with  
the table, wherein the egg transfer device is configured  
to simultaneously lift a plurality of generally  
vertically oriented eggs from an egg flat and place the  
plurality of eggs within respective cradles, and wherein  
the egg transfer device is configured to simultaneously  
lift and remove the plurality of eggs from the plurality  
of cradles; and

a plurality of sample heads operably associated  
with the table, each of which is configured to extract  
material from a respective egg within a respective cradle  
and to deposit the extracted material within a respective  
sample receptacle in a sample template.

101. The system of Claim 100, further  
comprising a plurality of orientation members, wherein  
each orientation member is operably associated with a  
respective cradle, and wherein each orientation member is  
configured to urge an egg within a respective cradle from  
a generally horizontal orientation to a generally  
vertical orientation.

102. The system of Claim 100, further  
comprising a classifier that is configured to identify  
live eggs among a plurality of eggs.

103. The system of Claim 102, wherein the  
classifier comprises an egg candling device.

104. The system of Claim 100, further  
comprising a sanitizer that is configured to apply  
sanitizing fluid to each sample head after each sample  
head has deposited material extracted from an egg into a  
respective sample receptacle.

105. The system of Claim 100, further

comprising a processor that is configured to create and store an association between material deposited within a sample receptacle with an egg from which the material was extracted from.

106. The system of Claim 102, wherein the egg transfer device is operably associated with the classifier and is configured to simultaneously lift only eggs identified as live eggs from an egg flat.

107. The system of Claim 102, wherein the sample heads are operably associated with the classifier and are configured to only extract material from eggs identified as live eggs.

108. The system of Claim 100, wherein the egg transfer device comprises:

a frame;

an array of manifold blocks movably supported by the frame, wherein each manifold block comprises an end portion and an internal passageway that terminates at a nozzle extending from the end portion, and wherein the array is expandable and contractible such that eggs can be lifted from and placed within egg flats of different sizes and/or array configurations; and

a plurality of flexible cups, each secured to a respective manifold block nozzle and each in fluid communication with an internal passageway of a respective manifold block, wherein each flexible cup is configured to engage and retain an egg in seated relation therewith when vacuum is provided within the flexible cup via a respective internal passageway and wherein each flexible cup is configured to release a respective egg when vacuum within the respective internal passageway is destroyed.

109. The system of Claim 100, wherein each

sample head comprises:

an elongated housing having opposite first and second ends and an elongated passageway extending therebetween; and

an elongated needle disposed within the elongated passageway and movable between a retracted position and first and second extended positions, wherein the needle comprises a tip, wherein the tip of the needle is contained within the passageway when the needle is in the retracted position, wherein the tip of the needle extends from the housing first end a first distance when the needle is in the first extended position, wherein the tip of the needle extends from the housing first end a second distance greater than the first distance when the needle is in the second extended position, wherein the needle is configured to extract material from an egg when in the first extended position, and wherein the needle is configured to dispense material extracted from an egg into a sample receptacle when in the second extended position.

110. The system of Claim 100, further comprising an egg flat transport system positioned adjacent to the table that transports flats of eggs to the egg transfer device.

111. The system of Claim 100, further comprising an egg flat transport system positioned adjacent to the table that transports flats of eggs from the egg transfer device.

112. The system of Claim 100, further comprising a sample template transport system positioned adjacent to the table and operably associated with the plurality of sample heads that transports sample templates to and from the plurality of sample heads.

113. The system of Claim 100, further comprising an egg cradle transport system operably associated with the table that moves the array of cradles relative to the plurality of sample heads.

114. The system of Claim 109, further comprising a locking plate operably associated with the plurality of sample heads, wherein the locking plate is configured to releasably restrain each elongated housing from movement when the needle is extended from the housing first end to the first extended position.

115. The system of Claim 99, wherein the apparatus for assaying material extracted from the eggs comprises:

a reagent dispenser that is configured to dispense a reagent into each of the receptacles of a template, wherein the reagent is configured to chemically react with the egg material in each receptacle to produce an indication of a characteristic of a respective egg; and

a detector that is configured to detect an indication of an egg characteristic in each of the receptacles.

116. The system of Claim 115, wherein the detector comprises a CCD camera.

117. The system of Claim 115, further comprising a sterilizer that is configured to destroy the reagent.

118. The system of Claim 117, wherein the sterilizer comprises a sterilizing agent dispenser that is configured to dispense a sterilizing agent into each of the receptacles to destroy the reagent.

119. The system of Claim 117, wherein the sterilizer comprises a heat generating source.

120. The system of Claim 117, wherein the sterilizer comprises a radiation generating source.

121. The system of Claim 115, wherein the reagent dispenser comprises a biosensor dispenser.

122. The system of Claim 99, wherein the apparatus for selectively processing eggs, comprises:  
a conveyor configured to convey egg carriers;  
a plurality of injection delivery devices  
operably associated with the conveyor, wherein the  
injection delivery devices are configured to inject a  
substance into eggs identified among a plurality of eggs  
in an egg carrier conveyed by the conveyor as having a  
characteristic; and

an egg removal device operably associated with  
the conveyor, wherein the egg removal device is  
configured to remove eggs identified as having a  
characteristic from an egg carrier conveyed by the  
conveyor.

123. The system of Claim 122, wherein the egg removal device comprises:

an array of manifold blocks, wherein each  
manifold block comprises an end portion and an internal  
passageway that terminates at a nozzle extending from the  
end portion; and

a plurality of flexible cups, each secured to a  
respective manifold block nozzle and each in fluid  
communication with an internal passageway of a respective  
manifold block, wherein each flexible cup is configured  
to engage and retain an egg in seated relation therewith  
when vacuum is provided within the flexible cup via a

15      respective internal passageway and wherein each flexible cup is configured to release a respective egg when vacuum within the respective internal passageway is destroyed.

124. The system of Claim 122, wherein the characteristic is gender, and wherein each injection delivery device is configured to inject a substance into eggs identified as having the same gender.

125. The system of Claim 122, wherein the characteristic is gender, and wherein the egg removal device is configured to remove eggs from an egg carrier identified as having the same gender.

126. The system of Claim 99, wherein the apparatus for selectively processing eggs, comprises:  
         a conveyor configured to convey egg carriers;  
         a first set of injection delivery devices  
 5      operably associated with the conveyor, wherein the injection delivery devices in the first set are configured to inject a substance into eggs identified as having a first gender in an egg carrier conveyed by the conveyor;

10              a second set of injection delivery devices operably associated with the conveyor and adjacent the first set of injection delivery devices, wherein the injection delivery devices in the second set are configured to inject a substance into eggs identified as  
 15      having a second gender in the egg carrier; and

                an egg removal device operably associated with the conveyor, wherein the egg removal device is configured to remove eggs identified as having a first gender from the egg carrier into a first receptacle, and  
 20      to remove eggs identified as having a second gender from the egg carrier into a second receptacle.

127. The system of Claim 126, wherein the egg removal device comprises:

an array of manifold blocks, wherein each manifold block comprises an end portion and an internal passageway that terminates at a nozzle extending from the end portion; and

a plurality of flexible cups, each secured to a respective manifold block nozzle and each in fluid communication with an internal passageway of a respective manifold block, wherein each flexible cup is configured to engage and retain an egg in seated relation therewith when vacuum is provided within the flexible cup via a respective internal passageway and wherein each flexible cup is configured to release a respective egg when vacuum within the respective internal passageway is destroyed.

128. The system of Claim 99, wherein the apparatus for selectively processing eggs, comprises:

a conveyor configured to convey egg carriers containing a plurality of eggs;

an egg removal device operably associated with the conveyor that segregates male eggs from female eggs;

a first set of injection delivery devices that are configured to inject a substance into male eggs; and

a second set of injection delivery devices that are configured to inject a substance into female eggs.

129. The system of Claim 128, wherein the egg removal device comprises:

an array of manifold blocks, wherein each manifold block comprises an end portion and an internal passageway that terminates at a nozzle extending from the end portion; and

a plurality of flexible cups, each secured to a respective manifold block nozzle and each in fluid communication with an internal passageway of a respective



10 manifold block, wherein each flexible cup is configured  
to engage and retain an egg in seated relation therewith  
when vacuum is provided within the flexible cup via a  
respective internal passageway and wherein each flexible  
cup is configured to release a respective egg when vacuum  
15 within the respective internal passageway is destroyed.

130. An egg processing system, comprising:  
an apparatus for extracting allantoic fluid  
from a plurality of eggs;  
an apparatus for assaying allantoic fluid  
5 extracted from the eggs to identify gender of the eggs;  
and  
an apparatus for selectively processing the  
eggs based on identified gender.

131. The system of Claim 130, wherein the  
apparatus for extracting allantoic fluid from a plurality  
of eggs comprises:

a table comprising a plurality of cradles  
5 arranged in an array, wherein each cradle is configured  
to receive an egg in a generally vertical orientation and  
to cause the egg to move to a generally horizontal  
orientation;

an egg transfer device operably associated with  
10 the table, wherein the egg transfer device is configured  
to simultaneously lift a plurality of generally  
vertically oriented eggs from an egg flat and place the  
plurality of eggs within respective cradles, and wherein  
the egg transfer device is configured to simultaneously  
15 lift and remove the plurality of eggs from the plurality  
of cradles; and

a plurality of sample heads operably associated  
with the table, each of which is configured to extract  
allantoic fluid from a respective egg within a respective  
20 cradle and to deposit the extracted allantoic fluid

within a respective sample receptacle in a sample template.

132. The system of Claim 131, further comprising a plurality of orientation members, wherein each orientation member is operably associated with a respective cradle, and wherein each orientation member is  
5 configured to urge an egg within a respective cradle from a generally horizontal orientation to a generally vertical orientation.

133. The system of Claim 131, further comprising a classifier that is configured to identify live eggs among a plurality of eggs.

134. The system of Claim 133, wherein the classifier comprises an egg candling device.

135. The system of Claim 131, further comprising a sanitizer that is configured to apply sanitizing fluid to each sample head after each sample head has deposited allantoic fluid extracted from an egg  
5 into a respective sample receptacle.

136. The system of Claim 131, further comprising a processor that is configured to create and store an association between allantoic fluid deposited within a sample receptacle with an egg from which the  
5 allantoic fluid was extracted from.

137. The system of Claim 133, wherein the egg transfer device is operably associated with the classifier and is configured to simultaneously lift only eggs identified as live eggs from an egg flat.

138. The system of Claim 133, wherein the

sample heads are operably associated with the classifier and are configured to only extract allantoic fluid from eggs identified as live eggs.

139. The system of Claim 131, wherein the egg transfer device comprises:

a frame;

an array of manifold blocks movably supported  
5 by the frame, wherein each manifold block comprises an end portion and an internal passageway that terminates at a nozzle extending from the end portion, and wherein the array is expandable and contractible such that eggs can be lifted from and placed within egg flats of different  
10 sizes and/or array configurations; and

a plurality of flexible cups, each secured to a respective manifold block nozzle and each in fluid communication with an internal passageway of a respective manifold block, wherein each flexible cup is configured  
15 to engage and retain an egg in seated relation therewith when vacuum is provided within the flexible cup via a respective internal passageway and wherein each flexible cup is configured to release a respective egg when vacuum within the respective internal passageway is destroyed.

140. The system of Claim 131, wherein each sample head comprises:

an elongated housing having opposite first and second ends and an elongated passageway extending  
5 therebetween; and

an elongated needle disposed within the elongated passageway and movable between a retracted position and first and second extended positions, wherein the needle comprises a tip, wherein the tip of the needle  
10 is contained within the passageway when the needle is in the retracted position, wherein the tip of the needle extends from the housing first end a first distance when

the needle is in the first extended position, wherein the tip of the needle extends from the housing first end a second distance greater than the first distance when the needle is in the second extended position, wherein the needle is configured to extract allantoic fluid from an egg when in the first extended position, and wherein the needle is configured to dispense allantoic fluid extracted from an egg into a sample receptacle when in the second extended position.

141. The system of Claim 131, further comprising an egg flat transport system positioned adjacent to the table that transports flats of eggs to the egg transfer device.

142. The system of Claim 131, further comprising an egg flat transport system positioned adjacent to the table that transports flats of eggs from the egg transfer device.

143. The system of Claim 131, further comprising a sample template transport system positioned adjacent to the table and operably associated with the plurality of sample heads that transports sample templates to and from the plurality of sample heads.

144. The system of Claim 131, further comprising an egg cradle transport system operably associated with the table that moves the array of cradles relative to the plurality of sample heads.

145. The system of Claim 140, further comprising a locking plate operably associated with the plurality of sample heads, wherein the locking plate is configured to releasably restrain each elongated housing from movement when the needle is extended from the

housing first end to the first extended position.

146. The system of Claim 130, wherein the apparatus for assaying allantoic fluid extracted from a plurality of eggs comprises:

an environmentally-controlled chamber that  
5 maintains temperature and/or humidity within one or more respective predetermined ranges;

a conveyor system that is configured to convey a plurality of sample receptacle templates through the chamber;

10 a biosensor dispenser disposed within the chamber and operably associated with the conveyor system, wherein the biosensor dispenser is configured to dispense a biosensor into each of the receptacles of a template conveyed via the conveyor system;

15 a color substrate dispenser disposed within the chamber and operably associated with the conveyor system, wherein the color substrate dispenser is configured to dispense a color substrate into each of the receptacles of a template conveyed via the conveyor system, wherein  
20 the biosensor and color substrate are configured to chemically react with allantoic fluid in each respective receptacle so as to produce an indication of gender of a respective egg; and

25 a detector operably associated with the conveyor system that is configured to scan each sample receptacle in a template conveyed via the conveyor system and to detect an indication of gender.

147. The system of Claim 146, wherein the detector comprises a CCD camera that is configured to detect a change in color of material in each sample receptacle of a template.

148. The system of Claim 146, further

comprising a sterilizer that is configured to destroy the biosensor.

149. The system of Claim 148, wherein the sterilizer comprises a sterilizing agent dispenser that is configured to dispense a sterilizing agent into each of the receptacles to destroy the biosensor.

150. The system of Claim 148, wherein the sterilizer comprises a heat generating source.

151. The system of Claim 148, wherein the sterilizer comprises a radiation generating source.

152. The system of Claim 146, wherein the biosensor dispenser comprises a yeast dispenser.

153. The system of Claim 130, wherein the apparatus for assaying allantoic fluid extracted from a plurality of eggs comprises:

an environmentally-controlled chamber that  
5 maintains temperature and/or humidity within one or more respective predetermined ranges;

a conveyor system that is configured to convey  
a plurality of sample receptacle templates through the  
chamber;

10 a yeast dispenser disposed within the chamber and operably associated with the conveyor system, wherein the yeast dispenser is configured to dispense a yeast into each of the receptacles of a template conveyed via the conveyor system;

15 a color substrate dispenser disposed within the chamber and operably associated with the conveyor system, wherein the color substrate dispenser is configured to dispense a color substrate into each of the receptacles of a template conveyed via the conveyor system, wherein

20 the yeast and color substrate are configured to  
chemically react with egg material in each respective  
receptacle so as to produce a color that indicates gender  
of a respective egg; and

25 a CCD camera operably associated with the  
conveyor system that is configured to scan each sample  
receptacle in a template conveyed via the conveyor system  
and to detect a color.

154. The system of Claim 153, further  
comprising a sterilizer that is configured to destroy the  
yeast.

155. The system of Claim 154, wherein the  
sterilizer comprises a sterilizing agent dispenser that  
is configured to dispense a sterilizing agent into each  
of the receptacles to destroy the yeast.

5 156. The system of Claim 130, wherein the  
apparatus for selectively processing eggs, comprises:  
a conveyor configured to convey egg carriers;  
a plurality of injection delivery devices  
operably associated with the conveyor, wherein the  
injection delivery devices are configured to inject a  
substance into eggs identified among a plurality of eggs  
in an egg carrier conveyed by the conveyor as having a  
characteristic; and

10 an egg removal device operably associated with  
the conveyor, wherein the egg removal device is  
configured to remove eggs identified as having a  
characteristic from an egg carrier conveyed by the  
conveyor.

157. The system of Claim 130, wherein the  
apparatus for selectively processing eggs, comprises:  
a conveyor configured to convey egg carriers;

a first set of injection delivery devices operably associated with the conveyor, wherein the injection delivery devices in the first set are configured to inject a substance into eggs identified as having a first gender in an egg carrier conveyed by the conveyor;

a second set of injection delivery devices operably associated with the conveyor and adjacent the first set of injection delivery devices, wherein the injection delivery devices in the second set are configured to inject a substance into eggs identified as having a second gender in the egg carrier; and

an egg removal device operably associated with the conveyor, wherein the egg removal device is configured to remove eggs identified as having a first gender from the egg carrier into a first receptacle, and to remove eggs identified as having a second gender from the egg carrier into a second receptacle.

158. The system of Claim 130, wherein the apparatus for selectively processing eggs, comprises:

a conveyor configured to convey egg carriers containing a plurality of eggs;

an egg removal device operably associated with the conveyor that segregates male eggs from female eggs;

a first set of injection delivery devices that are configured to inject a substance into male eggs; and

a second set of injection delivery devices that are configured to inject a substance into female eggs.

159. An egg processing system, comprising:

an apparatus for extracting allantoic fluid from a plurality of eggs, comprising:

a table comprising a plurality of cradles arranged in an array, wherein each cradle is configured to receive an egg in a generally



vertical orientation and to cause the egg to move to a generally horizontal orientation;

an egg transfer device operably associated with the table, wherein the egg transfer device is configured to simultaneously lift a plurality of generally vertically oriented eggs from an egg flat and place the plurality of eggs within respective cradles, and wherein the egg transfer device is configured to simultaneously lift and remove the plurality of eggs from the plurality of cradles; and

a plurality of sample heads operably associated with the table, each of which is configured to extract allantoic fluid from a respective egg within a respective cradle and to deposit the extracted allantoic fluid within a respective sample receptacle in a sample template;

an apparatus for assaying allantoic fluid extracted from the eggs to identify gender of the eggs, comprising:

a chamber;

a conveyor system that is configured to convey a plurality of sample receptacle templates through the chamber;

a biosensor dispenser disposed within the chamber and operably associated with the conveyor system, wherein the biosensor dispenser is configured to dispense a biosensor into each of the receptacles of a template conveyed via the conveyor system;

a color substrate dispenser disposed within the chamber and operably associated with the conveyor system, wherein the color substrate dispenser is configured to dispense a color substrate into each of the receptacles of

a template conveyed via the conveyor system,  
 wherein the biosensor and color substrate are  
 configured to chemically react with allantoic  
 fluid in each respective receptacle so as to  
 produce an indication of gender of a respective  
 egg; and

a detector operably associated with the  
 conveyor system that is configured to scan each  
 sample receptacle in a template conveyed via  
 the conveyor system and to detect an indication  
 of gender; and

an apparatus for selectively processing the  
 eggs based on identified gender.

160. The system of Claim 159, further  
 comprising a plurality of orientation members, wherein  
 each orientation member is operably associated with a  
 respective cradle, and wherein each orientation member is  
 configured to urge an egg within a respective cradle from  
 a generally horizontal orientation to a generally  
 vertical orientation.

161. The system of Claim 159, further  
 comprising a classifier that is configured to identify  
 live eggs among a plurality of eggs.

162. The system of Claim 161, wherein the  
 classifier comprises an egg candling device.

163. The system of Claim 159, further  
 comprising a sanitizer that is configured to apply  
 sanitizing fluid to each sample head after each sample  
 head has deposited allantoic fluid extracted from an egg  
 into a respective sample receptacle.

164. The system of Claim 159, further

comprising a processor that is configured to create and store an association between allantoic fluid deposited within a sample receptacle with an egg from which the allantoic fluid was extracted from.

165. The system of Claim 161, wherein the egg transfer device is operably associated with the classifier and is configured to simultaneously lift only eggs identified as live eggs from an egg flat.

166. The system of Claim 161, wherein the sample heads are operably associated with the classifier and are configured to only extract allantoic fluid from eggs identified as live eggs.

167. The system of Claim 159, wherein the egg transfer device comprises:

a frame;

an array of manifold blocks movably supported by the frame, wherein each manifold block comprises an end portion and an internal passageway that terminates at a nozzle extending from the end portion, and wherein the array is expandable and contractible such that eggs can be lifted from and placed within egg flats of different sizes and/or array configurations; and

a plurality of flexible cups, each secured to a respective manifold block nozzle and each in fluid communication with an internal passageway of a respective manifold block, wherein each flexible cup is configured to engage and retain an egg in seated relation therewith when vacuum is provided within the flexible cup via a respective internal passageway and wherein each flexible cup is configured to release a respective egg when vacuum within the respective internal passageway is destroyed.

168. The system of Claim 159, wherein each

sample head comprises:

an elongated housing having opposite first and second ends and an elongated passageway extending therebetween; and

an elongated needle disposed within the elongated passageway and movable between a retracted position and first and second extended positions, wherein the needle comprises a tip, wherein the tip of the needle is contained within the passageway when the needle is in the retracted position, wherein the tip of the needle extends from the housing first end a first distance when the needle is in the first extended position, wherein the tip of the needle extends from the housing first end a second distance greater than the first distance when the needle is in the second extended position, wherein the needle is configured to extract allantoic fluid from an egg when in the first extended position, and wherein the needle is configured to dispense allantoic fluid extracted from an egg into a sample receptacle when in the second extended position.

169. The system of Claim 159, further comprising an egg flat transport system positioned adjacent to the table that transports flats of eggs to the egg transfer device.

170. The system of Claim 159, further comprising an egg flat transport system positioned adjacent to the table that transports flats of eggs from the egg transfer device.

171. The system of Claim 159, further comprising a sample template transport system positioned adjacent to the table and operably associated with the plurality of sample heads that transports sample templates to and from the plurality of sample heads.

172. The system of Claim 159, further comprising an egg cradle transport system operably associated with the table that moves the array of cradles relative to the plurality of sample heads.

173. The system of Claim 159, further comprising a locking plate operably associated with the plurality of sample heads, wherein the locking plate is configured to releasably restrain each elongated housing from movement when the needle is extended from the housing first end to the first extended position.

174. The system of Claim 159, wherein the detector comprises a CCD camera that is configured to detect a change in color of material in each sample receptacle of a template.

175. The system of Claim 159, further comprising a sterilizer that is configured to destroy the biosensor.

176. The system of Claim 159, wherein the biosensor dispenser comprises a yeast dispenser.

177. The system of Claim 159, wherein the chamber comprises an environmentally-controlled chamber wherein temperature and/or humidity are maintained within one or more respective predetermined ranges.

178. The system of Claim 159, wherein the apparatus for selectively processing eggs, comprises:  
a conveyor configured to convey egg carriers;  
a plurality of injection delivery devices operably associated with the conveyor, wherein the injection delivery devices are configured to inject a substance into eggs identified among a plurality of eggs

in an egg carrier conveyed by the conveyor as having a characteristic; and

10           an egg removal device operably associated with the conveyor, wherein the egg removal device is configured to remove eggs identified as having a characteristic from an egg carrier conveyed by the conveyor.

179. The system of Claim 159, wherein the apparatus for selectively processing eggs, comprises:

a conveyor configured to convey egg carriers;

a first set of injection delivery devices

5           operably associated with the conveyor, wherein the injection delivery devices in the first set are configured to inject a substance into eggs identified as having a first gender in an egg carrier conveyed by the conveyor;

10           a second set of injection delivery devices operably associated with the conveyor and adjacent the first set of injection delivery devices, wherein the injection delivery devices in the second set are configured to inject a substance into eggs identified as having a second gender in the egg carrier; and

15           an egg removal device operably associated with the conveyor, wherein the egg removal device is configured to remove eggs identified as having a first gender from the egg carrier into a first receptacle, and to remove eggs identified as having a second gender from the egg carrier into a second receptacle.

180. The system of Claim 159, wherein the apparatus for selectively processing eggs, comprises:

a conveyor configured to convey egg carriers containing a plurality of eggs;

5           an egg removal device operably associated with the conveyor that segregates male eggs from female eggs;

a first set of injection delivery devices that are configured to inject a substance into male eggs; and

10 a second set of injection delivery devices that are configured to inject a substance into female eggs.